



SANYO Semiconductors

DATA SHEET

LA6563 — Monolithic Linear IC For CD players 4-channel Bridge (BTL) Driver

Overview

The LA6563 is a 4-channel bridge (BTL) driver for CD players.

Features

- Built-in bridge connection (BTL) POWER AMP 4-channel
- I_O max 1A
- MUTE circuit (main power is ON/OFF) with 3 systems
- Built-in STBY circuit (all circuits are OFF)
- Provides bias voltage (VREF) switching function (Select external or internal reference voltage. Internal reference voltage is 2.5V: typ)
- Output voltage (dynamic range) is high. (6V: typ)

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Power supply voltage	V_{CC} max	$V_{CC} = VS *1$	14	V
	VS max	$V_{CC} = VS *1$	14	V
Maximum input voltage	V_{IN} max		13	V
Maximum output current	I_O max	Each BTL-AMP of CH1 to CH4	1	A
MUTE pin voltage	V_{MUTE}		13	V
Allowable power dissipation	P_d max	Independent IC	0.8	W
		Mounted on a specified board *2	2.0	W
Operating temperature	T_{opr}		-30 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

*1. V_{CC} and VS must be shorted externally to use. V_{CC} : signal system power supply, VS : power system supply.

*2. Specified board: 114.3mm × 76.1mm × 1.6mm, glass epoxy board.

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Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Power supply voltage	V _{CC}	V _{CC} = VS	4 to 13	V

Electrical Characteristics at Ta = 25°C, V_{CC} = VS = 8V, V_{REF} = 1.65V, V_{REF-SW} = 3.3V, MUTE1 = MUTE2 = MUTE3 = 3.3V, unless otherwise specified

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Whole						
No-load current consumption	I _{CC-ON}	All AMP output ON, MUTE; HI		30	45	mA
	I _{CC-OFF}	All AMP output OFF, MUTE; LOW		5	10	mA
	I _{CC-OFF-STBY}	All circuits OFF, STBY: L			1	mA
STBY ON voltage	STBY-ON		2			V
STBY OFF voltage	STBY-OFF				0.5	V
STBY hysteresis voltage	STBY-HYS			80		mV
Output AMP block						
Output offset voltage	V _{OFF}	Between (+) and (-) output of each channel	-50		+50	mV
Output voltage	V _O	R _L = 8Ω, Voltage between (+) and (-) output of each channel *1		6		V
Closed circuit voltage gain	VG1	*2	5.4	6	6.6	times
Slew rate	SR	For output by AMP alone, it must be doubled *3	0.5			V/μs
MUTE ON voltage	V _{MUTE-ON}	MUTE *4	2			V
MUTE OFF voltage	V _{MUTE-OFF}	MUTE *4			0.5	V
MUTE hysteresis voltage	V _{MUTE-HYS}			80		mV
Input OP-AMP block						
Output offset voltage	V _{IN-OFF}	For BUFFER	-10		+10	mV
Input voltage range	V _{IN-OP}		0		V _{CC} -1.5	V
Output current (SINK)	V _{IN-SINK}			2		mA
Output current (SOURCE)	V _{IN-SOURCE}		300	500		μA
[OP-AMP block]						
Output offset voltage	OP-V _{OFF}	For BUFFER	-10		+10	mV
Input voltage range	OP-V _{IN}		0		V _{CC} -1.5	V
Output current (SINK)	OP-SINK	SINK current		10		mA
Output current (SOURCE)	OP-SOURCE	SOURCE current		10		mA
VREF-AMP block						
VREF-AMP offset voltage	V _{OFF-VREF}	VREF-SW "H" (For external reference voltage selected)	-10		+10	mV
Internal VREF voltage	VREF-CONST	VREF-SW "L" (For internal reference voltage selected)	2.3	2.5	2.7	V
VREF input voltage range	1B _{IN}		1		V _{CC} -1.5	V
VREF switch voltage 1	V _{SW1}	Select external reference voltage *5	3			V
VREF switch voltage 2	V _{SW2}	Select internal reference voltage *5			1	V

*1. Voltage for both ends of the load when connecting the 8Ω load between outputs. Input is H or L.
Output is saturated.

*2. Input AMP is 0dB for BUFFER.

*3. Design guaranteed performance.

*4. MUTE is HI for output ON and LOW for output OFF (AMP output is OFF, HI impedance).
Each MUTE activates independently to a corresponding channel.

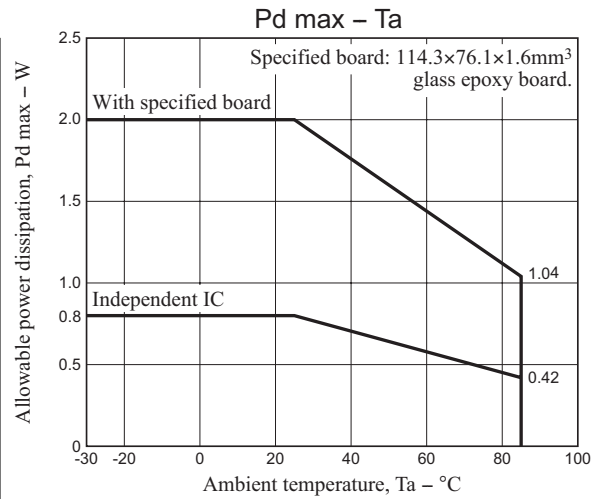
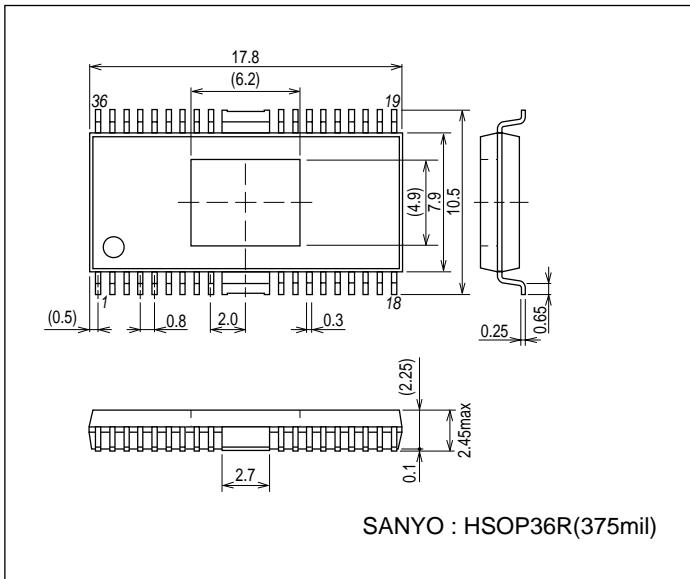
*5. VREF-SW is set to "H" for switching to external reference voltage and "L" for switching to internal reference voltage.

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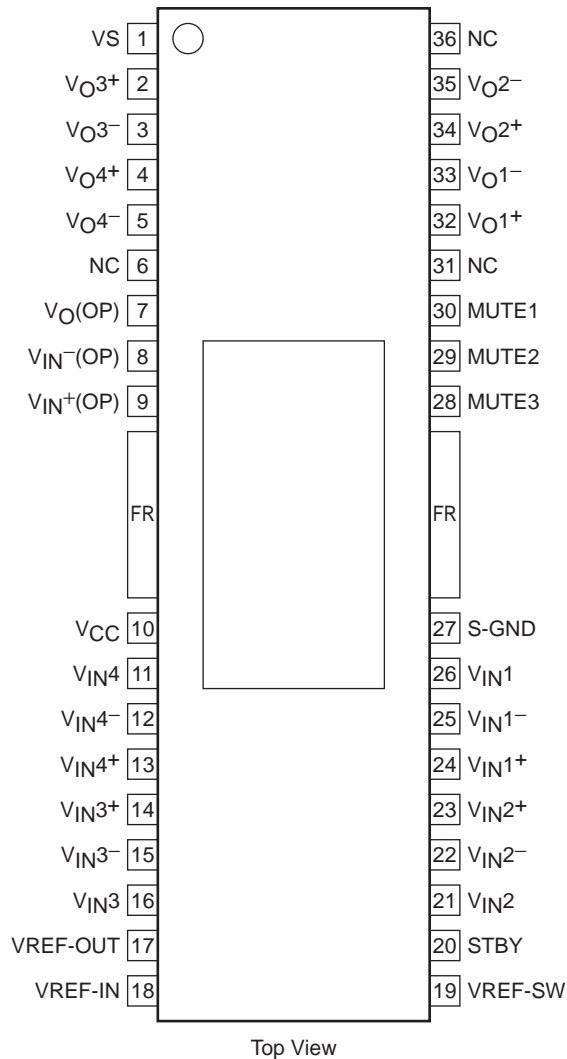
Package Dimensions

unit : mm (typ)

3251



Pin Assignment



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Pin Function

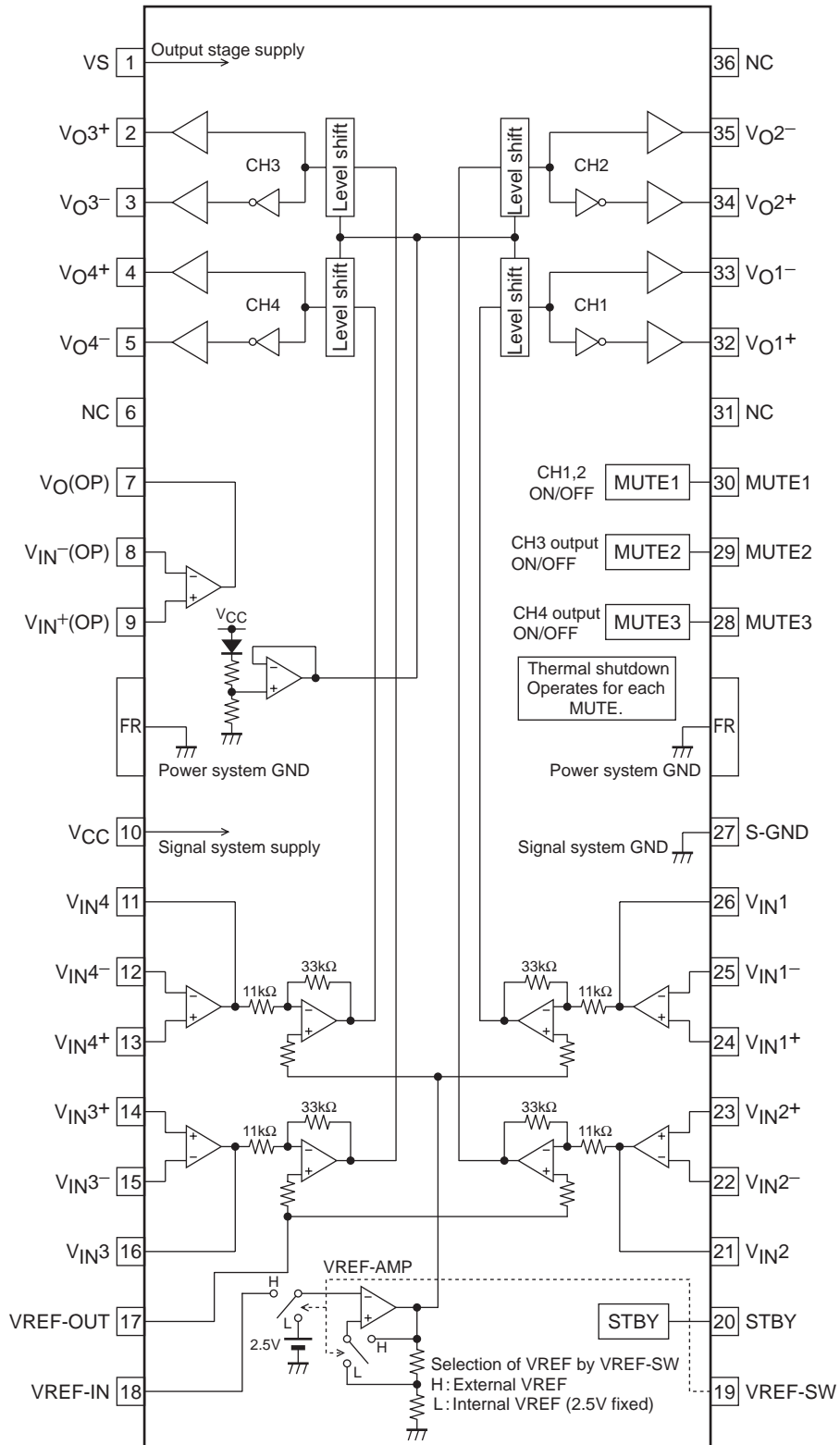
Pin No.	Pin name	Pin function
1	VS	Output stage power supply (short-circuited with V_{CC}).
2	V_{O3}^+	Output pin for channel 3 (+), Plus output for V_{IN3}
3	V_{O3}^-	Output pin for channel 3 (-), Minus output for V_{IN3}
4	V_{O4}^+	Output pin for channel 4 (+), Plus output for V_{IN4}
5	V_{O4}^-	Output pin for channel 4 (-), Minus output for V_{IN4}
6	NC	No connection. Do not used.
7	$V_O(OP)$	OP-AMP output pin.
8	$V_{IN}^-(OP)$	OP-AMP inverted input pin.
9	$V_{IN}^+(OP)$	OP-AMP non-inverted input pin.
10	V_{CC}	Signal system supply (short-circuited with VS).
11	V_{IN4}	Input pin for channel 4 (Channel 4 input amplifier output pin)
12	V_{IN4}^-	Input amplifier for channel 4, Inverted input pin.
13	V_{IN4}^+	Input amplifier for channel 4, Non-inverted input pin.
14	V_{IN3}^+	Input amplifier for channel 3, Non-inverted input pin.
15	V_{IN3}^-	Input amplifier for channel 3, Inverted input pin.
16	V_{IN3}	Input pin for channel 3 (Channel 3 input amplifier output pin)
17	VREF-OUT	VREF output pin (VREF amplifier output pin).
18	VREF-IN	Reference voltage input pin (VREF amplifier input pin).
19	VREF-SW	VREF changeover pin. External VREF selected with "H" and internal VREF selected with "L" (2.5V fixed)
20	STBY	Turns ON/OFF the whole circuit (Operation ON with "H" and OFF with "L")
21	V_{IN2}	Input pin for channel 2 (Channel 2 input amplifier output pin)
22	V_{IN2}^-	Input amplifier for channel 2, Inverted input pin.
23	V_{IN2}^+	Input amplifier for channel 2, Non-inverted input pin.
24	V_{IN1}^+	Input amplifier for channel 1, Non-inverted input pin.
25	V_{IN1}^-	Input amplifier for channel 1, Inverted input pin.
26	V_{IN1}	Input pin for channel 1 (Channel 1 input amplifier output pin)
27	S-GND	Signal system ground.
28	MUTE3	ON/OFF for channel 4 output.
29	MUTE2	ON/OFF for channel 3 output.
30	MUTE1	ON/OFF for channel 1 and 2 outputs.
31	NC	No connection. Do not use.
32	V_{O1}^+	Output pin for channel 1 (+), Plus output for V_{IN1}
33	V_{O1}^-	Output pin for channel 1 (-), Minus output for V_{IN1}
34	V_{O2}^+	Output pin for channel 2 (+), Plus output for V_{IN2}
35	V_{O2}^-	Output pin for channel 2 (-), Minus output for V_{IN2}
36	NC	No connection. Do not use.

*1. Center frame (FR) becomes GND for the power system. Set this to the minimum potential together with S-GND (signal system).

*2. Short-circuit V_{CC} (signal system power supply) and VS (output stage power supply) externally.

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Block Diagram



Pin Description

Pin No.	Pin name	Function	Description	Equivalent circuit
26 25 24 21 22 23 16 15 14 11 12 13	V_{IN1} V_{IN1^-} V_{IN1^+} V_{IN2} V_{IN2^-} V_{IN2^+} V_{IN3} V_{IN3^-} V_{IN3^+} V_{IN4} V_{IN4^-} V_{IN4^+}	Input	Input pin. Total gain is set with the gain of this input AMP. With BUFFER (input AMP gain: 0dB), the total input/output gain becomes six-fold.	
32 33 34 35 2 3 4 5	V_{O1^+} V_{O1^-} V_{O2^+} V_{O2^-} V_{O3^+} V_{O3^-} V_{O4^+} V_{O4^-}	Output	Output for channel.	
30 29 28	MUTE1 MUTE2 MUTE3	MUTE	ON/OFF of corresponding channel output. MUTE:H Output ON MUTE:L Output OFF * When the MUTE pin is open, the output becomes OFF (similar to the case of MUTE:L)	

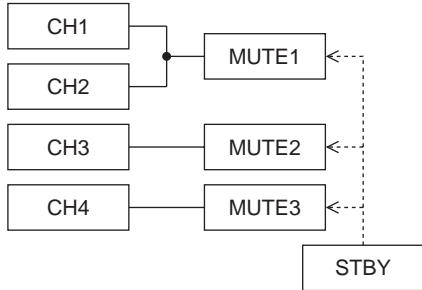
MUTE, STBY, VREF-SW Description

1) Relation of MUTE and output

Each MUTE	Output			
	CH1	CH2	CH3	CH4
H	ON			
L	OFF			

- *1. With output OFF, the output has a high impedance.
- *2. MUTE operates independently for each channel.

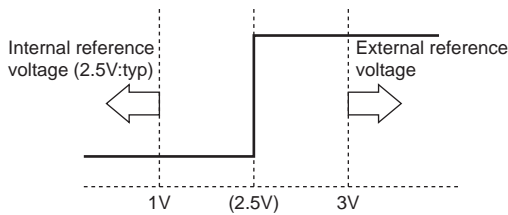
2) Relation of each channel and MUTE



* Short-circuit VS and VCC externally.

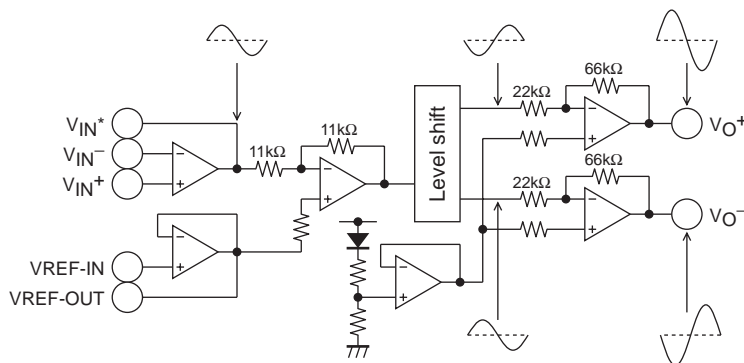
3) Relation of VREF-SW and reference voltage

VREF-SW	VREF-OUT
H	External reference voltage
L	Internal reference voltage (2.5V: typ)



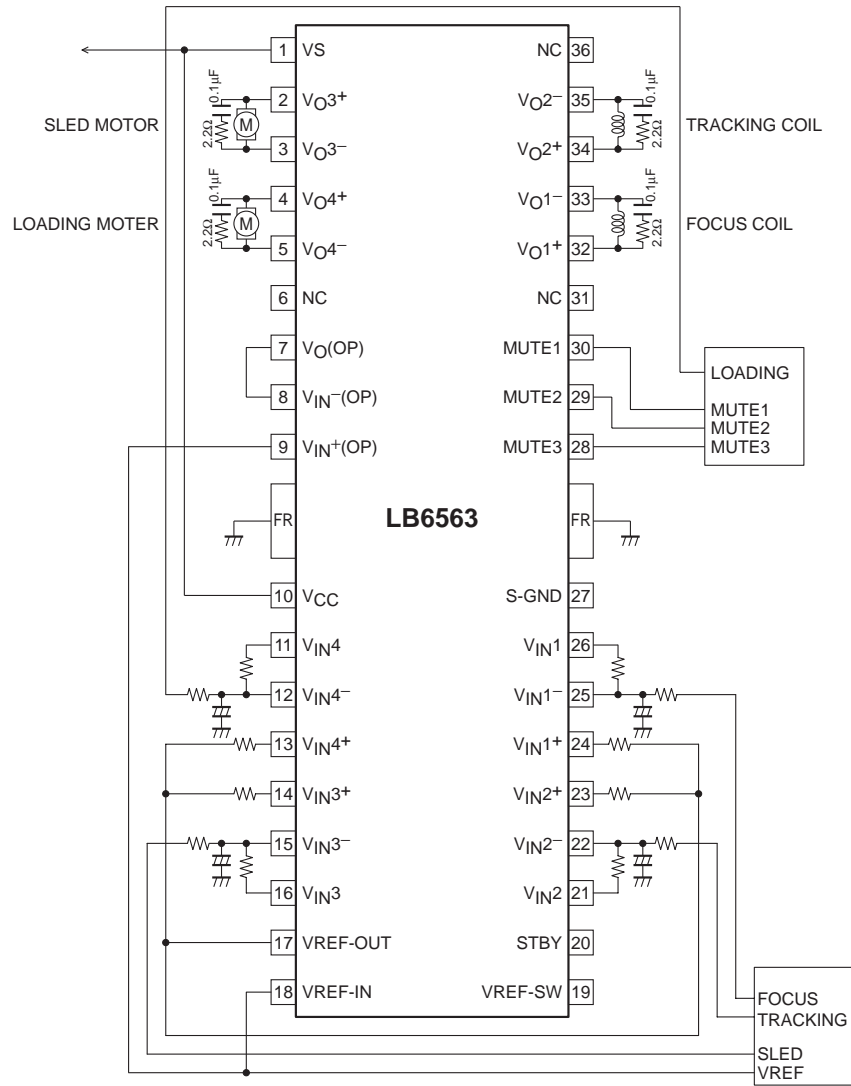
* Selects external or internal (fixed at 2.5V:typ) VREF.

I/O Summary



MUTE operates only for output amplifier of each corresponding channel while STBY operates for the whole circuit including output amplifier.

Application Circuit Example



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